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Innovating without a brief: Tackling urban poverty through anthropology, data, design and lean methods

Bernise Ang

INNOVATING WITHOUT A BRIEF

TACKLING URBAN POVERTY THROUGH ANTHROPOLOGY, DATA, DESIGN AND LEAN METHODS

Social innovation labs are witnessing a new entrant in an unexpected form: civic initiatives reflecting the rigour of social sciences, the analytical power of data, the innovation frameworks from design, and the agility to span the innovation of Silicon Valley to grassroots-driven change. **Bernise Ang** deconstructs a composite methodology blended with a complexity that matches the issues the method seeks to tackle.

Bernise Ang is co-founder and Executive Director of Zeroth Labs, an experimental research lab and consultancy which uncovers behavioural insights and applies them to public policy issues. They do this by blending methods from the social sciences, management strategy, and the start-up world to work with public sector agencies to co-create new services and products, and innovate business models with public sector agencies.

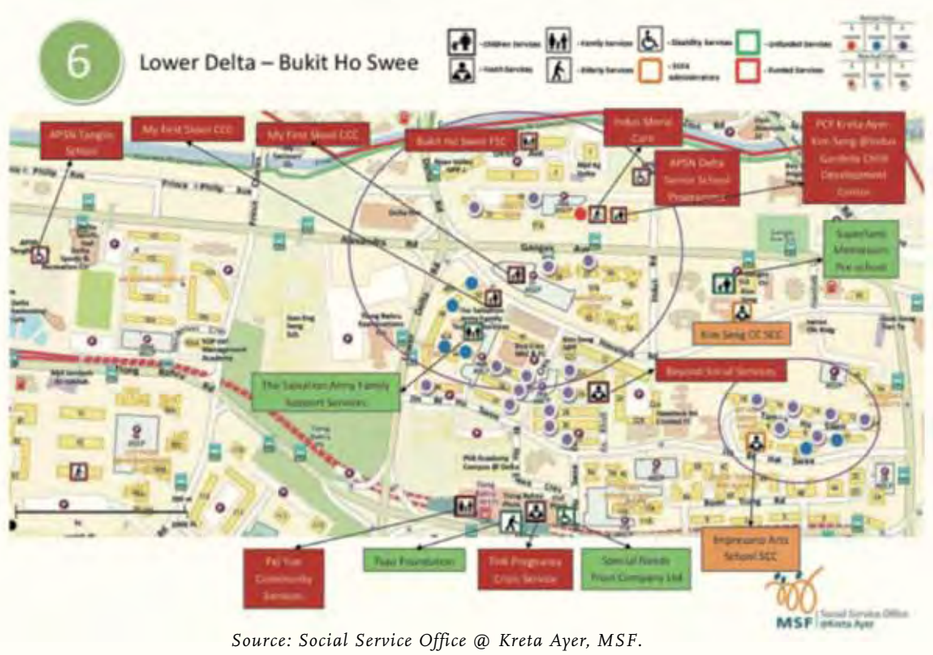
Sati (not her real name) receives S$180 a month in public assistance for herself and her two young children. She and her family are residents of the service boundary of Bukit Ho Swee, a district in the south of Singapore. She effectively became a single mother when her husband was convicted for drug possession last year. She struggles to stay on top of household needs, feed her kids, *and* keep an eye on them. The children love fish fingers, and she buys the frozen packs in bulk when there's a sale as it's "easy and cheap," even though she admits it is not the healthiest food for her kids. When asked if she would like to increase her income to buy healthier food, she said she was not interested in getting a job at this stage. If she worked, she would need to send her children to the childcare centre and she wouldn't be able to afford that. More importantly, she wanted to be around her kids, especially in their early years, to "keep them safe in this area."

What was implicit in Sati's words was that there were negative forces from which she wished to protect her kids. This *was* a low-income neighbourhood struggling with various challenges including substance abuse, loan sharks, primary school dropouts, and suicides.

To further complicate things, Sati's immediate financial constraints made it nearly impossible to access childcare, which prevented her from taking up most forms of employment. This further impacted her financial empowerment, which placed additional stress on Sati for day-to-day decision-making, and limited her capacity for longer-term planning, such as around issues of, say, asset accumulation[1] or her children's tertiary education (and the steps leading hitherto). This series of correlated events is not exhaustive.

It is also noteworthy that there has been a structural change within the public assistance system in Singapore. There is now an additional network of local government agencies, known as Social Service Offices (SSOs). The SSOs often work in partnership with the front lines of public assistance, known as Family Service Centres (FSCs). The Kreta Ayer SSO in particular has undertaken an effort within their service boundary to map existing services for residents, including significantly those serving low-income residents.[2]

From the maps, it is clear that a dominant majority of the existing social service entities are operations of service delivery. We have not found programmes in the current social services landscape (be they stand-alone entities or programmes within larger agencies serving similar demographic groups) specifically set up to understand the system dynamics and root causes of the complex issues within the neighbourhood.



Source: Social Service Office @ Kreta Ayer, MSF.

From an ecosystem standpoint, we have found a gap and opportunity in the space of research and analysis of complexity relating to the situation of low-income families, their social mobility, and issues such as and relating to inter-generational poverty. This is the opportunity and space in which Zeroth Labs[3] has begun its innovation work.

THE ROLE OF ZEROTH LABS

Following a discussion which included representatives from Bukit Ho Swee Family Service Centre (BHS FSC, now known as South Central Family Service Centre), The Thought Collective, and the National Council of Social Services (NCSS), our team was invited to play a role akin to "innovator-in-residence" in an effort to re-imagine the future of public assistance in Singapore, with BHS FSC as a pilot.

We had licence to dream up various kinds of experiments. With that latitude, it was imperative to set out the premise that would form the foundation of our engagement:[4]

Participatory. Principally this was important for the legitimacy of any outcome. However, it was also philosophically important for the team that the process of arriving at any solution was itself participatory.

Analysis-based. Part of the value of bringing our team in was that we were not just executing a programme to address needs, but also providing an understanding of the root issues from which those needs arise.

Resident-centred. The most important premise of our work was that any resulting solutions address real issues faced by those we intend to serve. We applied a mindset prevalent in start-up culture: to solve a real "pain point" (a problem or unmet need) for your customer in order for your solution to gain traction.

METHOD DECONSTRUCTION: PARTICIPATORY DESIGN

In this section, I outline how the team constructed an approach based on first principles. We essentially reverse-engineered a process by asking ourselves research questions as to what each step or element would require for a minimum level of rigour to be met. I highlight the insights we uncovered to subsequent process innovation and the design principles that led us to reverse-engineer a part of the process.

The Hackathon

Examining the hackathon model was the first in a series of deconstruction of methods for problem-solving and innovating. The hackathon format is characterised by high energy, relatively unstructured participation ("just come along and bring your ideas") and a short time frame for conception through to prototype. These hackathons typically feature a theme (e.g., save our climate) and the rest of the event is a function of the energy and creativity from the participants.

Insights and Opportunities

In some previous events, a number of participants spent significant time unsure about what they should work on and in some cases, what apps they should build. As participants, they were essentially involved in a voluntary capacity and as generalists, their energy and enthusiasm were not channelled effectively in the absence of a useful level of familiarity with the problem presented. This suggests the lack of opportunity or window of time for participants to think about the problem or develop familiarity and context around it.

It also appeared that providing a theme alone was not sufficient. There was a need for stronger problem definition. This would better direct participants' energy and ideas for a task that was essentially problem-solving in nature. This is particularly critical in the context of social issues, which are inherently more complex than typical hackathon outputs would suggest. Take for example the taxi apps. The simplistic use of themes such as saving the environment were arguably broad and generic, leading to solutions that did not reflect the complexities of the systemic social issues to which they could be responding in the first place.

Design principles

We used the above insights to establish a set of design principles that would guide the development of the participatory elements of the project. Their role is to translate the intent into priorities and goals of any given design project.[5] Below are the design principles we developed:

i) Generating more familiarity with the problem being solved and building context around it.
ii) Creating opportunities for those involved to share, develop and build upon one another's ideas.
iii) Structuring better design challenges that create a space for creativity and wild ideas, yet offer some direction so ideas are relevant to issues at hand.

Based on these three design principles, the resulting elements the team developed for participatory design were as follows, in chronological sequence:

An **online platform** was created for participants to begin "concepting" ideas for the neighbourhood. The objective was to enable participants to become more acquainted with the subject matter of the experiment, i.e., the key challenges faced by residents in the neighbourhood. This took place over the course of a month, before in-person co-creation activities began.

A **"human library"** session was conducted. Here, one "borrowed" people instead of books to tap on their knowledge and life experiences. This enabled low-income residents from the neighbourhood to participate by sharing their stories with young professionals and others from the wider community.

A **creative brainstorm** followed the human library session, allowing the stories participants just heard and realities on the ground to anchor their idea generation.

An **"inner workings"** workshop on the operational dimensions of the FSC was organised. This was conducted by the Programme Director of the FSC, who shared the daily organisational challenges and realities faced by social workers working with the neighbourhood's struggling families.

A panel discussion, "Urban Poverty 101," was organised featuring Donald Low from the Lee Kuan Yew School of Public Policy and Gerard Ee of Beyond Social Services. Low spoke from the macro-economic structural perspective, and Ee shared extremely real stories of the low-income and homeless Singaporeans from his personal interaction with them.

A **hackathon** followed. This involved participants generating concepts, developing hypotheses around their solutions and the problems they sought to tackle, and testing them with potential users from the neighbourhood. Participants created "prototypes" or physical representations of their concepts, which they presented at the end of the hackathon.

The hackathon had more participants who were residents of the neighbourhood than from the wider public. This is noteworthy in Singapore's context as such initiatives typically do not actually involve the beneficiaries or end-users in problem-solving or idea generation.

However, no amount of participatory action could lead to successfully tackling actual problems if the brief was not clear. Problem-solving required the rigour of research possibly developed through understanding the field extremely well, and by virtue of that, the complex issues that made up the system dynamics of the neighbourhood. The question was, "How do we analyse complexity?"

Idea board. Source: Zeroth Labs

Residents interviewed during the Henderson hackathon. Source: Zeroth Labs.

Kampong Economy prototype. Source : Zeroth Labs.

METHOD DECONSTRUCTION: ANALYSING COMPLEXITY

The Design Challenge

We believe that effective idea generation requires a foundation of deep insights that form the basis of strong problem definition. This takes the form of a "design challenge," which sets the scope for participants to respond to. This term is borrowed from IDEO's approach termed as Human-Centred Design (HCD).[5]

An effective design challenge has the following characteristics:

(1) It provides sufficient space and openness for exploratory ideas, hence encouraging creativity.

(2) It is sufficiently defined in scope so that there is meaningful direction, and ideas are relevant to the challenge.

Thus, the crux of a successful project is premised ultimately on obtaining deep insights. We embarked on a research process with a blended approach of methods to understand the dynamics of the neighbourhood, and included one approach to test early hypotheses guiding potential solutions. With each method described, we provide an example of an insight uncovered or research process decision made, through the analysis. The methods are as follows:

- Ethnography, from anthropology
- Systems science and complexity
- HCD/User-Centred Design (UCD), from design fields, particularly product and industrial design
- Data analysis
- Lean start-up method

Ethnography

Ethnography is the systematic study of people and cultures, designed to explore cultural phenomena where the researcher observes society. It is a means to represent graphically and in writing the culture of a group.[6]

Application

The "society" or "culture" being studied belonged to that of low-income families in the subject neighbourhood. Data collection methods included participant observation, interviews and field notes. Two methods, surveys and focus group discussions, were not used in this study. Although both methods are commonly used in community needs assessment, the team had significant experience with these methods and found them to be ineffective in delivering more nuanced behavioural insights in complex system dynamics.

Insight

The protection of Sati's children from the influences of the neighbourhood was more significant than the importance of increasing financial buffers through employment, even at nutritional cost for her children. This was counter-intuitive for what one might expect of mothers, single or otherwise, in view of children's health.

Systems Science & Complexity

The study of complex systems investigates how relationships between parts give rise to the collective behaviour of a system and how the system interacts and forms relationships with its environment.[7] It is the study of dynamics and processes of change found in a range of physical and biological phenomena.[8]

Application

We were guided by systems science and complex systems theory in developing a model of the inter-related elements, with a goal of identifying the "root" causes of inter-generational poverty in the neighbourhood. More generally, we sought to map the relationships among these elements, in terms of "systems hierarchy," ranging from items such as primary school truancy to employment opportunities for those in challenging circumstances. The information used for the development of this map was the raw qualitative data from our ethnographic research.

Insight

We found dozens of links across various types of social, economic, behavioural and environmental dimensions in the neighbourhood. While our initial hypothesis was that we would be able to identify a single root cause to the issues in the neighbourhood, this turned out to be rather reductionist on hindsight. Instead, the systems mapping led us to identify five key factors to be most fundamental as driving forces of the cycles that persisted in the neighbourhood. These were, in the broadest terms:

1) Education
2) Employment
3) Financial Empowerment
4) Social Connectedness
5) Self-Belief

Human-Centred Design thinking (HCD)

HCD (also known as User-Centred Design and design thinking) is a process not restricted to interfaces or technologies. In HCD, the needs, wants and limitations of the end users of a product, service or process are given attention at each stage of the design process. The chief difference from other product design philosophies is that HCD tries to optimise the product around how users can, want, or need to use the product, rather than forcing the users to change their behaviour to accommodate the product.[9]

Application

Based on the five key factors elucidated from the systems mapping above, we used part of the HCD approach to develop design challenges (as earlier described) to anchor the remaining design and research process.

Insight

In contrast to most HCD projects which employ a single design challenge for the entire project, we developed five design challenges, corresponding to the five key factors identified. We realised that this was due to the complexity of the issue we were tackling—inner-city poverty, and as a result of the significance of the various dimensions involved, developing more design challenges would allow each dimension to be specifically tackled. We also believed that having one design challenge for each dimension would be more effective than having one broad, generic design challenge on "urban poverty" in directing the design effort for idea generation and subsequent concept prototyping.

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Data Analysis

Data analysis is a technique of data science, which is the methodical study of the generalisable and scalable extraction of knowledge from data. It incorporates varying elements and builds on techniques and theories from many fields, including mathematics, probability models, machine learning, statistical learning, data engineering, pattern recognition and learning, and visualisation, among others with the goal of extracting meaning from data and creating data products.[10]

Application

We obtained data from BHS FSC. We did not access the actual case files, which were bound by confidentiality. Instead we worked with aggregate data on FSC's clients including age, location, number of children, income, education level, employment status and others. We ran analyses on this data set to uncover relationships that may be of interest. These relationships may not have been found through our earlier qualitative research.

Insight

We found that there was an inverse relationship between full-time employment and domestic violence. In the data set, we had four different employment variables: full-time, part-time, contract, and unemployed. This finding was interesting in the context of interviews with subject matter experts (specifically social workers in that neighbourhood). They shared a view that the key to "solving the issues of struggling families" was in the consistency of income, and that the actual level of income (be it high or low) had less effect on the thriving functioning of families. Following this logic, "part-time employment" should have also yielded a statistically significant correlation in addition to "full-time employment", yet this was not the case. This suggests possibly further lines of inquiry surrounding the relationship between domestic violence and employment (and other factors).

Lean Start-up Method

The Lean Start-up Method is a scientific approach to creating and managing start-ups, and to develop a product that better meets customers' needs, thereby increasing market demand for the product. It teaches the founder how to drive a start-up—how to steer its direction, when to change course, and when to persevere and develop a solution with maximum acceleration. It is a principled approach to new product development.[11] In the case of social solutions, we interpret "maximum acceleration" to mean maximum reach/impact, and "product development" to refer to the process of creating a solution (be it in the form of a product or a service).

Application

Through this method, we formulated a condensed approach to conducting customer-oriented product development. This scaffolding guided the project participants through the entire process of the hackathon. It offered help in

- articulating assumptions to be validated or invalidated;
- developing hypotheses around the problems they were seeking to solve; and
- testing those hypotheses.

Insight

One hackathon team originally attempted to create a job-matching platform for middle-aged to elderly women to find jobs with cleaning agencies. Through adapting the principles of the Lean Start-up Method to their innovation, they discovered that the need was not in simply getting these women jobs, but in also granting these women greater job flexibility. This was where the idea of an "Uber[12] for cleaning aunties" came about, where job seekers in this network do not have to go through cleaning agencies to find jobs, but are connected directly to potential customers. The model, if proven valid, will allow shorter and more flexible working hours and better wages per hour for these women.

TRANSLATING CLOSED RESEARCH TO OPEN PARTICIPATORY DESIGN

Based on the various research and analysis methods we blended together, the result was a rich picture of the neighbourhood that revealed the micro factors (i.e., behavioural, on the individual level) and macro factors (i.e., system dynamics).

We translated these findings into a synthesised form of a "community brief." This was published online but a hard copy was also available for anyone within the neighbourhood or the wider public without internet access who wished to participate in developing solutions for the area. This brief was an important component of the project because it was a key tool for the in-depth research to reach the masses, an uncommon feature in community projects in Singapore.

The community brief was therefore both an exercise in conveying rich but otherwise inaccessible insights about the neighbourhood as well as powerful storytelling that would place these issues in context and allow readers to develop an emotional connection to the challenges at hand.

The resulting community brief included the following components:

- Map of neighbourhood showing location of rental and non-rental flats
- Neighbourhood statistics including apartment types, household income levels, marriage, family types, and others
- The five key factors and corresponding design challenges
- Stories accompanying each design challenge, based on composites constructed from actual residents we had interviewed or come across
- Existing community programmes to provide a reference to the current social services landscape
- An overall framework of tackling complex social challenges, a methodology we developed based on this project. Figure 2 shows this framework.

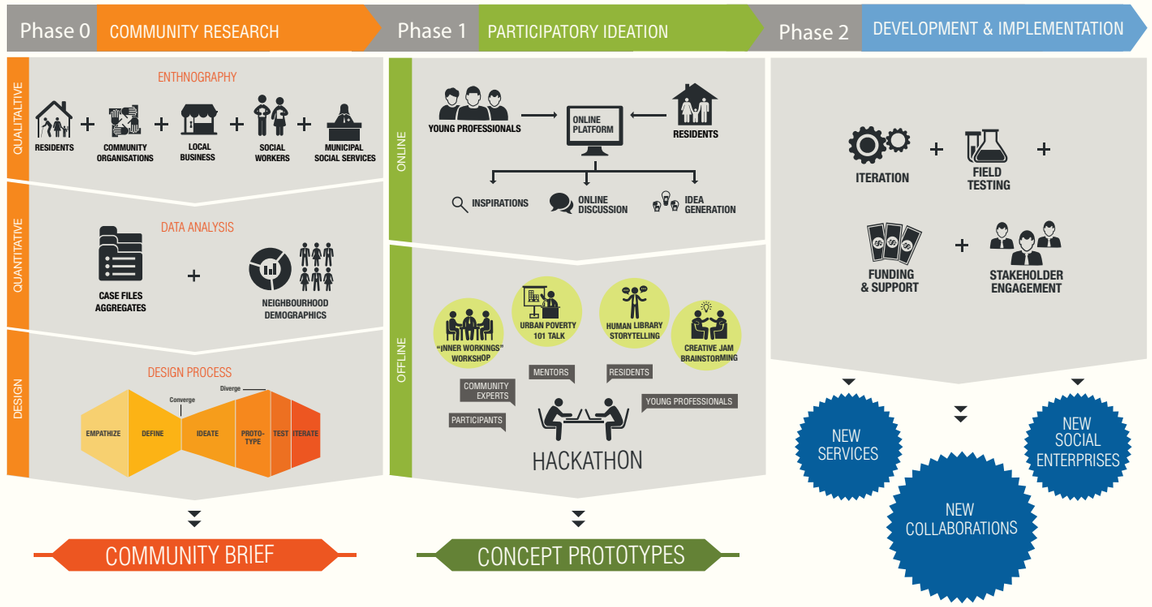

Figure 2: Zeroth Labs model for neighbourhood transformation.
Source: Zeroth Labs

"WE UNDERSTAND THAT SUCH A BLENDED APPROACH TO TACKLING COMPLEX PROBLEMS IS RELATIVELY NOVEL IN THE CONTEXT OF INTERNATIONAL DEVELOPMENT. A TRUE BLEND OF METHODS REQUIRES A DEXTERITY THAT ENABLES THE MOST USEFUL PARTS OF THESE DIFFERENT TECHNIQUES TO BE EXTRACTED, COMBINED, AND DESIGNED IN CONTEXT AND SEQUENCE SO AS TO BRING ABOUT A POWERFUL FRAMEWORK."

INNOVATION IN THREE DIMENSIONS

Through this experiment, we have innovated on methods to tackle complex social issues. This can be seen along three axes:

Closed + Open

We brought together two types of processes that do not typically come together: the closed process being research/consulting and the open process being human library + crowdsourcing + hackathon.

Sequence matters: We designed for the participatory phase to follow the closed research. In this way, the research findings and the design challenges to which the public can respond form the basis of idea generation from the wider community, increasing the likelihood of its rigour and relevance.

Qualitative + Quantitative

This was essentially a combination of ethnography together with data analysis. We emulated the methods of cultural anthropologists as well as analytical techniques of data scientists. However, rather than just listing different findings one on top of the another, we used the qualitative insights to set the context for statistically significant quantitative findings to further inform our systems analysis.

Chaotic + Systematic

The framework we developed had deliberate chaos in specific elements (e.g., Creative Jam,[13] online crowdsourcing, interaction between residents and participants during the hackathon). It also had one key element that was systematic: the use of the Lean Start-up Method was an anchor for participant teams during the two days. For this, we got them to think in terms of articulating assumptions and hypotheses to be validated or otherwise, and these were tested over the course of the hackathon.

CONCLUSION

We understand that such a blended approach to tackling complex problems is relatively novel in the context of international development. A true blend of methods requires a dexterity that enables the most useful parts of these different techniques to be extracted, combined, and designed in context and sequence so as to bring about a powerful framework.

We believe this framework is a starting point for more thought and rigour in future practice. We posit that the combinatorial approach of our framework, bringing together behavioural and systems analysis, lends itself well to the analysis, development and running of cities. The ability to situate the social, health, legal, educational, infrastructural and technological dimensions of a city will be increasingly critical in the management and governance of urban zones. The methods for doing so need to reflect complexity and rate-of-change.

It is our hope that this framework will continue to be built upon, not just by Zeroth Labs but also by others, to contribute towards a much more robust and adaptive approach to development practice in the long term. ■

Endnotes

1 Asset accumulation is an approach to social mobility which focuses directly on creating opportunities for the poor to acquire, keep, and pass on wealth to the next generation. This approach complements other poverty-focused strategies developed over the past decade, particularly sustainable livelihoods and social protection. Moser, Pickett & Sparr, Cutting-Edge Development Issues for INGOs: Applications of an Asset Accumulation Approach, Brookings Institute, 2007.

2 See Kreta Ayer Social Service Office map on page 35.

3 Zeroth Labs, www.zeroth.co

4 "HCD Toolkit," HCD Connect, www.hcdconnect.org/toolkit/en

5 Stephanie Hornung, "Aligning your team through design principles", https://medium.com/trial-and-error-1/aligning-your-team-through-design-principles-a1d39bd1f55e

6 "Qualitative research methodologies: ethnography" BMJ Publishing Group, www.bmj.com/content/337/bmj.a1020

7 "About Complex Systems," New England Complex Systems Institute, http://necsi.edu/guide/

8 Ben Ramalingam and Harry Jones, "Exploring the science of complexity: Ideas and implications for development and humanitarian efforts", Overseas Development Institute, www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/833.pdf

9 "HCD Toolkit," HCD Connect, www.hcdconnect.org/toolkit/en

10 Definitions, Rafik B. Hariri Institute for Computing and Computational Science & Engineering at Boston University: www.bu.edu/hic/2014/07/10/2014-07-09-meeting-prep/

11 "The Lean Startup Methodology," The Lean Startup, http://theleanstartup.com/principles

12 Uber, www.uber.com

13 Creative Jam was the name we gave to the element "creative brainstorm" in our discussion on "Design Principles" on page 37.